

-----Original Message-----

From: Berger, Jeff [ED] [<mailto:Jeff.Berger@iowa.gov>]

Sent: Monday, October 15, 2007 11:52 AM

To: Godes, Bridget [LEGIS]; Hanlon, Kathy [LEGIS]; Knief, Amanda [LEGIS]

Cc: Thomas, Roger [LEGIS]; Dotzler, Bill [LEGIS]

Subject: Request from interim

Please forward this to anyone else that needs to see it.

In the first meeting of the Skilled Worker Interim, we were asked to provide a listing of all STEM initiatives underway. This list addresses the major efforts. There are other regional efforts not on this list, but this gives a good start. Sorry this is so late....

Additional clarifications from the conversation today's Skilled Worker Interim (10/15):

1. Iowa has adopted statewide core K-12 content standards in Reading, Math, and Science. This action was done last legislation session. These are different from the statewide graduation standards.
2. Iowa schools are keenly aware of public opinion related to the "need for change." The above attached initiatives, plus the work on the core curriculum and increased expectations like graduation standards, all "stem" from an increased sense of urgency around the need for change.
3. On the data presented from a recent poll:
 - a. The results were national. In Iowa, voters tend to think more "like" their schools. They do understand the need to change, but are generally more satisfied with their schools than national results portray.
 - b. That said, the Department has been on record for years promoting the need for change. This isn't a new thing - we believe the work on the model core curriculum is the best solution to the concerns identified in the data.
4. The Department is recommending that the legislature carve-out an additional \$10 million within the new funding for Teacher Quality specifically designated for schools to use to implement the model core.

Jeff Berger
Legislative Liaison
Iowa Department of Education
(515) 281-3399 Office
(515) 250-3728 Cell
(515) 281-4122 Fax
Jeff.Berger@iowa.gov
www.state.ia.us/educate/

Iowa Department of Education

K-12 and Community College Math and Science Initiatives 2007

The DE in conjunction with the Iowa Math and Science Coalition, conducted a survey of the STEM initiatives underway at community colleges in the state. The survey requested that colleges submit the following information about each project: title of the initiative, description (<100 words), funding sources, partner institutions, project coordinator's contact information, and website url. The results do not include all of the wide range of activities underway at Iowa's comprehensive community colleges, but they do shed some light on key areas of emphasis. Additionally, the Department added K-12 STEM initiatives to this list to create a comprehensive overview of this area of emphasis.

Iowa Content Network

The Iowa Content Network is an online resource for K-12 educators containing research summaries in the areas of reading, mathematics, and science. The Content Network enables Iowa educators to select professional development opportunities that have been shown to be effective and/or promising. Studies summarized on the Content Network are ranked in terms of research design (1=No Empirical Evidence; 5=Gold Standard research design)

Our Kids

Our Kids is a statewide collaborative effort among various PK-12 entities (DE, AEAs, local districts) as well as higher education. The focus is to improve achievement for English Language Learners. Our Kids focuses on multiple disciplines, including math and science.

Every Student Counts

Every Student Counts is a statewide collaborative initiative with two goals: (1) To improve achievement of K-12 students in mathematics, and (2) To build learning communities engaged in the study of mathematics, mathematics instruction, and student achievement in mathematics through effective implementation of Iowa's Professional Development Model.

Every Learner Inquires

Every Learner Inquires is a capacity building effort in science targeting improved student understanding and achievement through improved instructional practices. Every Learner Inquires focuses on inquiry-based instruction aligned with the National Science Education Standards and follows the Iowa Professional Development Model. There are two learning strands, one focusing on the elementary levels and the other on secondary.

Iowa Math and Science Coalition

Iowa Math and Science Coalition is an alliance of leaders from business and industry, education, and public policy working to achieve mathematics and science literacy for all citizens in Iowa. The Iowa Math and Science Coalition has received an annual appropriation from the legislature to support its work. The Iowa Math and Science Coalition is directed by the University of Northern Iowa.

Model Core Curriculum

The Model Core Curriculum project was developed in response to needs identified by the DE and the State Board of Education through an intensive high school information and data gathering

process undertaken in the spring of 2005 and the passage of Senate File 245 during the 2005 legislative session. Senate File 245 required the identification of a model core curriculum and established a statewide core curriculum completion rate goal. The goals are twofold: (1) To ensure that all Iowa students have access to a rigorous and relevant curriculum to prepare them for success in postsecondary education and the emerging global economy; (2) To provide a tool for Iowa educators to use to assure that essential subject matter is being taught and essential knowledge and skills are being learned. The content areas include literacy, math and science and 21st Century Skills.

Project Lead the Way

The Division of Community Colleges and Workforce Preparation within the DE has developed a statewide system that utilizes a national pre-engineering program called Project Lead the Way® (PLTW). The state system fosters the integration of academics into career and technical education and creates a seamless transition for students to move from secondary to postsecondary education. Project Lead the Way® is a not-for-profit 501(C)3 corporation that promotes pre-engineering education for middle and high school students. The system incorporates strong partnerships between public schools, higher education institutions, and the private sector to increase the quantity and quality of Iowa's advanced manufacturing and biotechnology workforce. The broad scope of the PLTW program prepares students for engineering and related careers and Iowa's community colleges and four year institutions. Thus far, more than 60 PLTW program sites have been established and more than 95 teachers have been trained to deliver the curriculum by an affiliate university's college of engineering (Iowa State University and the University of Iowa are PLTW affiliate universities). Several community colleges have provided program implementation leadership within their regions. The state's 15 community colleges (via a consortium) have partnered with the DE, the Iowa Department of Economic Development (IDED), and the Kern Foundation on a \$3.1 million proposal to expand PLTW to 60 sites across the state (four within each community college region). The community colleges are matching IDED equipment and training funds one-to-one and are leveraging Kern Foundation funds. Included in the proposal is \$100,000 for establishment of the PLTW bioengineering course at ten sites.

Math-in-CTE

The DE is planning to implement a model to integrate mathematics into Iowa's career and technical programs at the secondary and postsecondary levels. The model, called Math-in-CTE (career and technical education), was researched, developed, and studied by the National Research Center for Career and Technical Education (NRCCTE). The original model was limited to secondary schools; however, the proposed Iowa model will expand implementation to the community colleges. Participants in discussion and planning include representatives from AEAs and math and CTE faculty from high schools and community colleges. Professional development will include an intensive summer workshop to prepare for the implementation of the model beginning in Fall 2008.

K-12 Outreach Activities

In addition to offering a variety of college credit courses, the state's community colleges embrace secondary schools by offering outreach activities such as summer camps and competitions to middle and high school students. For example, Iowa Central Community College reported establishing a program called DIVA Tech designed to encourage middle school females to pursue careers in math, science, and technology. The college also hosts competition days in the spring where high school students participating in dual credit courses compete in a variety of career and technical areas. Des Moines Area Community College has partnered for Project SEMI – a mobile laboratory that travels around to area high schools. The college has also established a CSI Biotechnology Summer Camp for high school students that focuses on forensic science. Indian Hills Community College is offering a middle school chemistry initiative and is starting an early college pilot program. Iowa Western Community College offers a two-day summer camp for

middle school students called Tech Daze that focuses on a wide variety of hands-on STEM-related activities. Iowa Valley Community College District partners to offer the First Lego League program which engages middle school students in real world problem solving utilizing math, science, and technology.

CTE Program Development in STEM Fields

The community colleges have been active in developing career and technical programs in STEM fields and the state's three targeted industries. Several colleges reported creating new two-year career and technical degree programs in the fields of information technology, bioscience/biotechnology, and advanced manufacturing. For example, Iowa Lakes Community College received a National Science Foundation (NSF) grant for biotechnology curriculum development and dissemination that includes funds to provide professional development to secondary and community college instructors, prepare a seamless transition between levels of education, and provide the region's industry with a trained cadre of biotechnicians. Kirkwood Community College reported developing certificate and diploma programs for Bachelor of Arts or Science degree holders that majored in basic science but need hands-on experience in basic biotechnology techniques to increase their chances of employment. Western Iowa Tech Community College received a grant from the U.S. Department of Labor Employment and Training Administration (DoL ETA) to provide advanced manufacturing training through innovative curricula and mobile training centers. The community colleges continue to develop a wide variety of CTE programs for students desiring to enter emerging STEM occupations.

Transfer Program and Articulation Agreement Development

The community colleges have also been active in efforts designed for students interested in pursuing a four year degree in STEM fields. The colleges reported having developed a number of two-year degree programs designed for transfer to four-year universities in STEM fields and articulation agreements between programs at each level. For example, North Iowa Area Community College has developed Associate of Arts (AA) and Associate of Science (AS) degree programs for students interested in further education and careers in the biosciences, computer science, and math or science teacher education. Northwest Iowa Community College has developed two year technology programs in computerized manufacturing technology, industrial instrument and control technology, and electrical technology that prepare students to transfer and earn a Bachelor of Engineering degree through Dordt College in two years. Kirkwood Community College has developed a transfer program in bioinformatics. Eastern Iowa Community College has developed a pre-engineering AS program articulation arrangement to allow for the seamless transition of students into university engineering programs. Des Moines Area Community College has established a 2+2 articulation agreement with the University of Northern Iowa (UNI), allowing biotechnology AS degree holders to transfer to UNI and complete a degree in biology or biotechnology in less than two years. Southeastern Community College has a project designed to integrate biotechnology concepts into the existing transfer and agriculture degree programs and the college to better prepare students for the job market and higher education.

Career Academy Development

Many of Iowa's community colleges have developed career academies in STEM fields within their regions. Career academies are programs of study that combine a minimum of two years of secondary education with a postsecondary program in a non-duplicative, sequential course of study. The programs integrate academic and career and technical content and often provide concurrent enrollment opportunities. Examples of STEM-related career academy initiatives reported include: Iowa Western Community College is developing a range of career academies and all but one of the high schools within its region participate in one or more academies. During the 2006-2007 academic year, Iowa Western initiated five medical academies in 14 high schools, nine information technology academies in 19 high schools, and three PLTW academies in five high

schools. Kirkwood Community College has developed career academies organized around the following fields: geospatial, computer programming, information systems management, local area networking, engineering, and advanced manufacturing. Iowa Valley Community College District offers a number of career academies at its campuses including a biotechnology career academy at Ellsworth Community College. Des Moines Area Community College has developed career academies in information technology, web page design, production engineering, and biotechnology. Other community colleges also offer career academies in STEM fields. Additionally, the colleges are very involved with offering college credit coursework to high school students through intergovernmental agreements with local school districts that generate supplemental weighting.

STEM-Related Professional Development Activities

The community colleges reported offering a wide range of professional development opportunities in STEM fields to high school faculty in addition to their own faculty. For example, Iowa Central Community College offers staff development opportunities for high school instructors in career and technical fields. The initiative helps to build relationships between secondary and community college educators and maintain continuity between courses and programs at the two levels. Northeast Iowa Community College has established a Regional Academy for Math and Science that offers STEM training to teachers. Iowa Western Community College has created a biotechnology education workshop for life science teachers to help them integrate biotechnology principles, techniques, and technology into their science curricula and to use inquiry-based methods. This fall, Iowa Lakes Community College is partnering with a variety of entities to offer training sessions to secondary teachers focusing on how to improve student proficiency in math and science. The college also offers a workshop for secondary and community college CTE teachers that allows instructors at both levels to discuss strategies to strengthen academic achievement in math, science, and technology. Des Moines Area Community College offers specialized staff development in technology areas to high school teachers in an effort to better align secondary and postsecondary programs. Western Iowa Tech Community College has worked with a local school on a differentiated math program. The college provides staff development to high school faculty related to the use of equipment and technology in the areas of advanced manufacturing, mobile training centers, career academies, biotechnology, chemistry, PLTW, and renewable fuels. Several colleges also reported being involved with providing professional development to career academy instructors.

Other STEM Initiatives

The community colleges reported being involved with a wide variety of other STEM-related activities including the Corridor STEM initiative, noncredit training in STEM fields for incumbent workers, specialized scholarship programs, the Iowa Biotech Workforce Development Project, the Advanced Technology Environmental and Energy Center, Sustainable Energy and Education Training Project, the American Wind Energy National Conference, and much more.